Product Brief

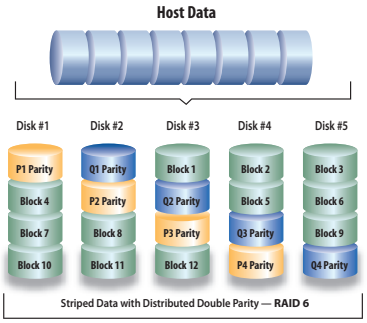
# 3ware® 9690SA

## High-Performance Serial Attached SCSI (SAS) RAID Controller

The LSI 3ware 9690SA SAS/SATA hardware RAID controllers deliver industry-leading RAID 6 and RAID 5 performance, expanded scalability, robust fault tolerance, and multi-terabyte capacities. A PCI Express host interface, StorSwitch™ architecture and sophisticated SAS and SATA II features drive this unrivaled performance.

### KEY FEATURES

- Scalable to 128 SAS and/or Serial ATA devices
- PCI Express x8 host interface
- Configuration flexibility with four configuration options
  - 8 internal ports
  - 8 external ports
  - 4 internal/four external ports
  - 4 internal ports
- SAS, SATA, and SATA II features, including 3Gb/s and NCQ
- 512MB DDR2 533 ECC protected memory
- Simultaneous double parity generation to maximize RAID 6 performance
- StorSwitch™ 8th generation non-blocking switch fabric for maximum controller throughput
- StreamFusion optimizes I/O accesses to maximize application performance under heavy workloads
- StorSave BBU with write journaling optimizes data protection and performance; remote battery support
- Low-profile form factor
- RAID levels 0, 1, 5, 6, 10, 50, and Single Disk




**RAID 6:** Two sets of parity data, P + Q, are striped across disks. RAID 6 safeguards against data loss during rebuild mode by allowing up to two consecutive drive failures for maximum fault tolerance.

### It's Time for SAS

3ware pioneered the way for SATA and now capitalizes on time-proven serial storage expertise to take users from parallel SCSI to SAS. The 9690SA seizes the moment to enter the market just as SAS hard drives, expanders and backplanes are more widely available and as enterprise infrastructures align to realize the potential of Serial Attached SCSI. As SAS makes inroads into the SCSI market, users will look to SAS to provide expanded connectivity and greater scalability and to the 3ware 9690SA for peace of mind.

### Connect, Expand, Protect with SAS

End users will enjoy configuration flexibility with four low profile PCI Express controller options: eight internal ports, eight external ports, four internal/four external ports, or four internal ports. Compatibility with industry standard SAS expanders will maximize flexibility. Each 9690SA SAS controller scales to support 128 SAS and/or SATA devices.

Advanced 3ware RAID architecture and SAS, SATA, and SATA II performance features, including 3Gb/s and NCQ, help rocket the 9690SA to RAID 5 and RAID 6 performance heights. An optional Battery Backup Unit with integrated write journaling and remote battery mounting capability provides added data protection in the event of a power outage. The 9690SA supports RAID levels 0, 1, 5, 6, 10, 50, and Single Disk.

### The RAID 6 Difference

RAID 6 eliminates the risk of data loss if a second hard disk drive fails while the RAID array is rebuilding. Uniquely, in the 3ware RAID 6 implementation, two sets of parity are simultaneously calculated, written, and rotated across all the drives. This second parity calculation enables the array to survive up to two drive failures without losing data, significantly improving fault tolerance. The 3ware RAID 6 double parity algorithm maximizes RAID 6 throughput, so that the 9690SA controllers deliver unequaled RAID 6 write performance.

### Enterprise-class RAID Storage

SAS is the preferred interface for the direct-attach server space, SCSI's former mainstay. SAS is for mission critical applications that require higher levels of availability and native expansion. SAS is optimized for the random performance requirements of the data center. The 9690SA's advanced RAID features, SAS connectivity, and powerful 3ware performance architecture make it the ideal SCSI controller replacement.

LSI 3ware 9690SA

# 3ware 9690SA Specifications

## 3ware 9690SA Features

- 8th-generation StorSwitch™ non-blocking switched architecture
- On-board I/O RISC processor and RAID offload provides true hardware RAID
  – SCSI device driver model to take advantage of SAS or inexpensive Serial ATA drives
- Bootable array support for greater fault tolerance of your OS
- Variable stripe size for performance tuning by application
- Support for greater than 2TB volumes
- 512MB DDR2 533 memory with ECC protection
- 128 max disk drives via SAS expanders
- Complete configuration management suite
  – 3ware BIOS Manager (3BM) – easy to use BIOS configuration tool
  – 3ware Disk Manager 2 – browser-based management tool
  – Command Line Interface (CLI) – scriptable configuration tool
- SNMP support
- SMTP support for email/pager notification
- Staggered drive spin-up support
- Auto carving allows LUNs > 2TB to be divided into multiple units for legacy operating systems limited to 2TB max. per LUN
- Battery Backup Unit (BBU) with remote battery support
- Write journaling for improved performance and data protection against accidental drive removal
- Multiple SAS/SATA RAID sets
- Multiple logical unit sizes and RAID levels on one card
- Hot-swap and hot-spare support for data availability
- Dynamic sector repair for robust data protection
- S.M.A.R.T. disk drive monitoring for reliability
- Emergency Flash Recovery protects against failed firmware upgrade
- Drive activity LED support
- Array/Drive Status and drive identification LED support
- Enclosure management support for SES 2.0 via I2C or in-band signaling
- Drive insertion and removal notification
- Online Capacity Expansion and RAID Level Migration
- RoHS 6 of 6 and WEEE compliant

## Operating System Support

- Microsoft® Windows® Vista/2003/XP, Mac OSX, Red Hat Linux, SuSE Linux, Fedora Linux, 2.4 Linux kernel, 2.6 Linux kernel, FreeBSD; 32/64-bit driver support for Windows, Linux and FreeBSD. For complete OS listing, go to: www.3ware.com/support/OS-support

## 3ware 9690SA Specifications

- Low profile form factor
- PCI Express x8 configurations, PCI Express 1.1 compliant
- Serial Attached SCSI (SAS) 1.1 specification support
- SATA 2.6 specification support
- BIOS PnP (plug and play) and BBS (BIOS boot specification) support
- Operating Temperature
  Controller: 0°C to 50°C
  BBU: 10°C to 40°C
- Power Requirements: 18W maximum
- Dimensions
  **9690SA-8I:** 7.60"L x 2.73"H (19.30cm L x 6.93cm H)
  **9690SA-8E:** 7.80"L x 2.73"H (19.80cm L x 6.93cm H)
  **9690SA-4I4E:** 7.25"L x 2.73"H (19.30cm L x 6.93cm H)
  **9690SA-4I:** 7.60"L x 2.73"H (19.30cm L x 6.93cm H)

## Service and Support

- 3-year warranty
- Support via the web at www.3ware.com/support
- For latest motherboard and hard drive compatibility listing go to: www.3ware.com/products//sys_compatibility.asp

## Accessories

- BBU-MODULE-04 Battery Backup Unit
- BATT-SPARE-02 Replacement battery for BBU-MODULE-04
- CBL-SFF8087-05M (0.5m Multi-lane internal cable)
- CBL-SFF8087-06M (0.6m Multi-lane internal cable)
- CBL-SFF8088SAS-10M (Universal key external cable, 1m)
- CBL-SFF8088SAS-20M (Universal key external cable, 2m)

## Applications for 3ware Controllers

Servers

Security/ Surveillance

Video Editing

Super Computing

NAS

Video On-Demand

Pro Audio

Disk-to-Disk Backup

## 3WARE 9690SA SERIES SELECTION GUIDE

| | 9690SA-8I | 9690SA-8E | 9690SA-4I4E | 9690SA-4I |
|---|---|---|---|---|
| Form Factor | Low profile | Low profile | Low profile | Low profile |
| SAS Ports | 8 Internal | 8 External | 4 Internal / 4 External | 4 Internal |
| Drive Interface | SATA+SAS | SATA+SAS | SATA+SAS | SATA+SAS |
| PCI Express | x8 | x8 | x8 | x8 |
| RAID Levels | 0, 1, 5, 6, 10, 50, Single Disk | 0, 1, 5, 6, 10, 50, Single Disk | 0, 1, 5, 6, 10, 50, Single Disk | 0, 1, 5, 6, 10, 50, Single Disk |
| Onboard Memory | 512MB DDR2 533 | 512MB DDR2 533 | 512MB DDR2 533 | 512MB DDR2 533 |
| Connector Type | SFF-8087 mini-SAS | SFF-8088 mini-SAS | SFF-8087/SFF-8088 mini-SAS | SFF-8087 mini-SAS |
| BBU with Remote Battery Support | Yes | Yes | Yes | Yes |

**For more information and sales office locations, please visit the LSI web sites at:**
**lsi.com** **3ware.com**

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